

AMENDMENT

The Commissioner is hereby authorized to charge payment of any additional fees involved with added Claims and the like to Deposit Account No. 19-0033.

IN THE CLAIMS

Please amend the claims as follows:

- 5b
5b1
1. A method of eliminating volcano effect in dual damascene comprising the steps of:
- 3
- providing a substrate having first and second insulative layers, optionally separated from each other by an intervening etch-stop layer formed thereon said substrate;
- 6
- forming a hole opening through said first and second insulative layers;
- 9
- forming a fill material over said substrate, including in said hole opening, wherein said fill material comprises I-line photo resist;
- 12
- A1

15 removing any excess fill material over said hole opening,
wherein said removing said any excess fill material is ac-
complished by chemical mechanical polishing;

18 forming a trench opening in said second insulative layer
over said hole opening in said first insulative layer, thus
21 completing the forming of said dual damascene structure on
said substrate;

24 removing said fill material from said hole opening;

depositing metal in said dual damascene structure; and

27 removing excess metal to complete the forming of said dual
damascene without the volcano effect.

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✓
Claim 8, please cancel.

9. The method according to claim 1, wherein said fill mate-
rial comprises spin-on organic oxide.

A2₃

10. The method according to claim 1, wherein said removing said fill material is accomplished by etching.

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13. The method according to claim 1, wherein said removing said excess metal is accomplished by chemical mechanical

3 polishing.

14. A method of eliminating volcano effect in dual damascene comprising the steps of:

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providing a substrate having a passivation layer formed over a first metal layer formed on said substrate;

6

forming a first insulative layer over said substrate;

9 forming an optional etch-stop layer over said first insulative layer;

12 forming a second insulative layer over said etch-stop layer;

15 forming a first photoresist layer over said second insulative layer and patterning said photoresist to form a first photoresist mask having a hole pattern;

18

etching said first and second insulative layers, including
said optional etch-stop layer through said hole pattern to
21 form a hole reaching said passivation layer;

removing said first photoresist mask;

24

forming a fill material over said substrate, including in

(said hole opening wherein said fill material comprises I-
27 line photo resist;

removing any excess fill material over said hole opening,

30 wherein said removing is accomplished by chemical mechanical
polishing;

33 forming a second photoresist layer over said substrate, including
said hole opening and patterning said second photoresist
to form a second photoresist mask having a trench
36 pattern;

etching said second insulative layer through said trench
39 pattern in said second photoresist mask to form a trench in
said second insulative layer, thus completing the forming
of said dual damascene structure in said substrate ;

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removing said second photoresist mask;

45 removing said fill material from said hole opening;

depositing a second metal in said dual damascene structure;

48 and

removing excess metal to complete the forming of said dual

51 damascene without the volcano effect.

AB and
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A4 C1
~~23.~~ The method according to claim 14, wherein said fill
material is spin-on organic oxide.

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~~Claim 24,~~ please cancel.

27. The method according to claim 14, wherein said remov-

AB ing said excess metal is accomplished by chemical mechani-

3 cal polishing [(CMP)].